

REMARKS

Claims 1-30 are pending in this application. Applicants appreciated the Office Action's indication that claims 4, 7-11, 15 and 18-22 contain allowable subject matter.

By this Amendment, claims 1, 4, 12, 15 and 24 are amended for better clarity, and claims 25-30 are added.

The Office Action rejects claims 1-3, 5, 6, 12-14, 16, 17, 23 and 24 under 35 U.S.C. §103(a) over U.S. Patent 6,517,486 to Li in view of U.S. Patent 6,687,013 to Isshiki et al. This rejection is respectfully traversed.

The Office Action admits that Li does not disclose or suggest a displacement measuring system, but asserts that Isshiki discloses this feature. Applicants respectfully submit that Li and Isshiki do not disclose or suggest a method usable to reduce displacement errors in an image-correlation-based displacement measuring system, comprising determining an estimate of an error amount corresponding to an uncompensated displacement value, the uncompensated displacement value representing a displacement between a reference image and a displaced image, wherein the estimate of the error amount includes an intra-reference-image error and is represented in the image-correlation-based displacement measuring system in relation to a displacement relative to an arbitrary reference image position, as recited in claim 1, and similarly recited in claims 12 and 24.

Li is directed to speckle-noise reduction in an image, but is not directed to reduction of estimated displacement errors. Li discloses applying an external force to compress an object in a reference image. (See Li at col. 3, lines 29-46.) The object is deformed to create a three-dimensional motion, and the in-plane motion must be estimated and corrected to ensure that the reference image 10 and the deformed object image 11 used to be compounded are spatially matched. (See Li at col. 3, lines 47-52.) Thus, Li discloses estimating and correcting motions associated with an actual deformation that is intentionally induced. Li

does not disclose or suggest an estimated displacement error that includes an intra-reference-image error and is represented in the image-correlation-based displacement measuring system in relation to a displacement relative to an arbitrary reference image position, as recited in claim 1, and similarly recited in claims 12 and 24.

Isshiki discloses remedying error components of laser interferometers. (See Isshiki at col. 2, lines 6-30.) Isshiki does not disclose or suggest an estimated displacement error that includes an intra-reference-image error and is represented in the image-correlation-based displacement measuring system in relation to a displacement relative to an arbitrary reference image position. Thus, Isshiki does not supply the subject matter lacking in Li.

For at least the above reason, Li and Isshiki do not disclose or suggest the subject matter recited in claims 1, 12 and 24.

Claims 2, 3, 5, 6, 13, 14, 16, 17 and 23 are each patentable over Li and Isshiki at least in view of the patentability of claims 1, 12 and 24, from which they respectively depend, as well as for the additional features they recite.

For example, Li and Isshiki do not disclose or suggest generating uncompensated displacement value based on a reference image and a displaced image, as recited in claim 2. The Office Action asserts that Li discloses "generating the uncompensated displacement value" at column 4, lines 34-42. However, Li discloses at lines 30-39 "for each pixel... by assigning the value of the best-matched pixel to the target pixel position, the object motion is corrected." Li discloses an object motion that is the deformation motion induced by the operator, but does not disclose a desired displacement measurement value derived from a displacement image and a reference image. Thus, Li does not disclose or suggest generating the uncompensated displacement value based on a reference image and a displaced image, as recited in claim 2.

Also, Li discloses substituting a pixel value from one image into another to remove speckle from a "compound" image. (See Li at col. 3, lines 29-46.) Li does not disclose or suggest determining a compensated displacement between the reference image and the displaced image, as recited in claim 3.

For at least the above reasons, Li and Isshiki do not disclose or suggest the subject matter recited in claims 1-3, 5, 6, 12-14, 16, 17, 23 and 24. Accordingly, withdrawal of the rejection of claims 1-3, 5, 6, 12-14, 16, 17, 23 and 24 under 35 U.S.C. §103(a) is respectfully requested.

The Office Action rejects claim 6 under 35 U.S.C. §103(a) over Li in view of Isshiki further in view of U.S. Patent 6,134,271 to Nakaya et al. This rejection is respectfully traversed.

Nakaya discloses a motion estimation process. (See col. 7, lines 55-58.) Nakaya does not disclose or suggest a method usable to reduce displacement errors in an image-correlation-based displacement measuring system, comprising determining an estimate of an error amount corresponding to an uncompensated displacement value, the uncompensated displacement value representing a displacement between a reference image and a displaced image, wherein the estimate of the error amount includes an intra-reference-image error and is represented in the image-correlation-based displacement measuring system in relation to a displacement relative to an arbitrary reference image position, as recited in claim 1. Thus, Nakaya does not supply the subject matter lacking in Li and Isshiki.

For at least the above reason, Li, Isshiki and Nakaya do not disclose or suggest the subject matter recited in claim 1, and claim 6 depending therefrom. Accordingly, withdrawal of the rejection of claim 6 under 35 U.S.C. §103(a) is respectfully requested.


New claims 26-30 are each patentable over Li and Isshiki at least in view of the patentability of claims 1, 12 and 24, from which they respectively depend, as well as for the

additional features they recite. For example, Li and Isshiki do not disclose or suggest an intra-reference-image error that includes position errors due to uncollimated light sources or optical distortions, or that includes errors that are characteristic of the image-correlation-based displacement measuring system.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-30 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachment:

Petition for Extension of Time
Amendment Transmittal

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